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# BOTANICAL GAZETTE.

*Vol. 2.* MAY, 1877. *No. 7.*

THE USE OF CARBON BISULPHIDE IN THE PRESERVATION OF PLANTS.—A correspondent sends us the following translation of the essential part of M. R. Lenormand's "Notes on the use of carbon bisulphide for the preservation of Herbaria," extracted from the *Bulletin de la Societe Botanique de France.*—[ED.]

"During a visit made me by my friend M. Doyere, he desired to see if I possessed an *Arum* which he had observed in the vicinity of Algiers without having had time to study it. In running through the fasiculus of my herbarium which contained the family of Aroides we too often had occasion to notice the ravages that had been made by insects principally in the tuberous roots of these plants. The idea immediately came to M. Doyere to rid me of this by means of carbon bisulphide of which he had made use with such wonderful results in the preservation of the cereals. * * * It is in the behalf of naturalists who too often notwithstanding the precautions they have taken, are grieved to see their collections deteriorate and go to ruin from the incessant attacks of these inveterate enemies, that I hasten to give it all publicity possible.

* * I have acted only under his (M. Doyere's) direction and counsel. The apparatus which I use was made from his designs. The quantity of carbon bisulphide, the time necessary for each test were all calculated by him. It is not then astonishing that I have always had the most complete success. * * I had made a box of white wood 1 meter and 50 centimeters long by 80 centimeters high and 50 centimeters wide, lined entirely inside with thin sheets of zinc well soldered together to prevent as much as possible all escape of vapor. The movable lid fitted on the sides of the box, so as to form a projection all around. The interior is divided width-wise into two apartments of which the one intended for the carbon bisulphide is but 1 decimeter broad—the partition is formed of thin wood, and stops at 6 centimeters from the bottom of the box and rises to within 8 centimeters of the top. The large apartment can hold ten or twelve fasiculi of my herbarium placed in two layers one above the other, the first or lower supported by two fixed bars at 6 centimeters from the bottom, or the height of the base of the partition.

"Two other *movable* bars (in order to render more easy the placing of fasiculi) support the second row of fasiculi, between which and the first there is a free space of 6 centimeters, between this second and the top of the box there is a space of 8 centimeters. Before placing the fasiculi in the box I loosen the cords which fasten them so that the sheets of paper will not rest crowded upon each other and in that way prevent the vapor from easily penetrating between them. The smaller apartment is loosely filled with shavings, I empty upon them one decilitre of carbon bisulphide, immediately replace the cover, with several heavy volumes on top to keep it from moving, and then close the edges by means of putty. The carbon bisulphide vaporizes rapidly. Although a high temperature greatly increases its energy it is not indispensable for the production of excellent effects as I have convinced myself in the course of my operations. The thermometer has varied between plus 10° and plus 2° centigrade, it has even decended to plus 1° and nearly to zero and yet the result has never been anything but satisfactory. When I opened the box at the end of three days (the time required for the operation) the nauseous odor which immediately escaped from within proved to me each time that the interior was filled with gas of which the ("anesthesique") action is so powerful. No larva could escape—not even those the most thoroughly protected in the debris of the plants that they had discovered. I have counted 50 of them on one sheet of my herbarium which contained the flowers of *Ficus Carica*. Usually they at first preserve their white color, but soon they take a brown tint more or less dark. The odor of the carbon bisulphide is soon gone; in a few hours the fasiculi do not retain a trace of it. As this substance is very inflammable it is prudent not to light a fire or use a candle or lamp in the same room where one is making use of it.

The plants which have been subjected to its action will not be entirely protected from future attacks, but they will be much less liable. * * * It is probable that one would not be obliged to make use of it again before four or five years, and this occasions neither trouble nor loss of time. Museums of Natural History and the possessors of large herbaria should make use of larger boxes in order to place more in them at the same time, increasing in proportion the quantity of carbon bisulphide."

BOTANICAL RAMBLES IN MIDDLE FLORIDA.—One accustomed to the open, rolling and highly cultivated country of the North will note a marked contrast in this Coral State. · In leaving the river banks of the St. John's it was my expectation to meet at frequent intervals good sized tracts of unwooded and cultivated lands, but there appeared, along the entire line of rail to the Gulf, nothing but a continued unbroken pine forest with here and there a village surrounded by open lots and a few fields. Yet, notwithstanding its sylvan character, there are, away from the rail, open places of frequent occurrence, of ponds, lakes, barrens, savannas, abandoned and cultivated plantations.

On approaching Baldwin, a junction station twenty miles from Jacksonville, and passing through open, low and wet piny lands, the Atamasco lily came in view at frequent intervals, as well as the Wampee and narrow leaved *Amianthium*. Gainsville was my objective point, and here, upon arrival March 13th, I made the necessary arrangements for the study of its immediate spring flora. The early season, with the frequent and extensive fires in the forests at this time led me to anticipate a meager harvest; yet, the elevated and rolling land, the varied and fertile soil and the advanced and luxuriant vegetation rendered my few days ramble here both interesting and profitable. In this vicinity, as elsewhere, are small meandering streams defined by marshy banks, dense thickets and sometimes impenetrable jungles of woody undergrowth. Just in such places occurred *Chionanthus Virginica*, L. white with fringed flowers, *Bignonia capreolata*, L., laden with beautiful red trumpet blossoms, *Magnolia glauca*, L., beginning to unfold its fragrant petals, *Pyrus arbutifolia*, L. var., *erythrocarpa*, Chapm., *Amorpha fruticosa*, L., *Leucothoe racemosa*, Gray, *Decumaria barbara*, L. and *Smilax Walteri*, Pursh. In the streets of the town and on the dry sandy railroad banks grew in large mats *Acanthospermum xanthioides*, DC.; while in the wet side ditches appeared plentifully, both in flower and fruit, *Mayaca Michauxii*, Schott & End., and *Jussiæa leptocarpa*, Nutt; and on the shady banks *Pyrrhopappus Carolinianus*, DC., *Lonicera sempervirens*, Ait., *Allium striatum*, Jacq., *Carex dasycarpa*, Muhl., with occasionally a flowering specimen of *Lactuca Canadensis*, L. var., *sanguinea*, T. & Gr. Frequently one will observe in the dry portions of these extensive forests a few small trees or scrubs of *Quercus Catesbei*, Michx., instead of pine and as land marks of apparent barren soil. While such slopes or ridges present no favored locations for particular plants except this oak and *Berlandiera subacaulis*, Nutt, they yield, nevertheless, with the adjacent dry soil such plants as *Asimina pygmæd*, Dunal, now coming in flower, *Ascyrum pumilum*, Michx., *Astragalus villosus*, Nutt., *Asclepias amplexicaulis*, Michx., *Jatropha urens*, L., var., *stimulosa*, J. Mueller, *Croton argyranthemus*, Michx., and *Rhynchospora plumosa*, Ell.

There appeared near this inland town, as not observed elsewhere, large and dense forests of unusually tall exogenous trees of which the Magnolia, the Hickory, and the

Swamp White Oak raised their spreading tops fully a hundred feet in the air. The land, covered by these stately monarchs, is quite rolling, composed of a mixed and fertile soil of clay, sand and vegetable mold. Penetrating these deep forests, with compass, very few herbaceous plants were seen, but an abundance of woody undergrowth of various entangling vines and shrubs of which *Symplocos tinctoria*, L 'Her. was the most interesting and a new acquisition.

Gainsville is a favorite resort for the invalid, probably in part due to the attractions of its rural scenes, dry atmosphere and moderate charges of living. A Brooklynian who had recovered his health here, and in consequence enjoyed excellent spirits, became a good friend and companion in my daily rambles. We engaged upon a days trip through a varied country to the Alachua or Sink, a large lake with a subterranean stream to the ocean. The botany, however, at our place of approach was disappointing, for we had been preceded—the lowing herd had cropped close the sloping banks, and the long snouted swine had subsoiled the bottom flats. I thought of Wm. Bartram who appeared here a hundred years ago [1774], and stood upon the banks of this same "Great Sink," so minutely and graphically described in his travels, the 'extensive Alachua savanna' as 'a level green plain, above fifteen miles over and fifty miles in circumference,' with the abundance of game 'disturbed, in its quiet retreat, only through the invasion of these Elysian fields by the painted and fearless Seminole." Our trip, however, to these historic grounds of the once great tribe of Alachuans, the Ancient Floridians, was not wholly fruitless; for, on the way we increased our list with the common *Ptelea trifoliata*, L., *Cratægus parvifolia*, Ait., and *Prunus umbellata*, Ell., *Vaccinium arboreum*, Marshall, *Ilex Cassine*, L., *Stachys Floridana*, Shuttl., *Corallorhiza odontorhiza*, Nutt, two feet high, *Aspidium patens*, Swz., and *Bumelia lycioides*, Gaert., var. *reclinata*, Gray, with indications of good plants obtained on a subsequent visit.

In this country one can often walk for hours through a comparative sameness of growth and then suddenly and unexpectedly enter a changed and interesting vegetation. There seems no certain guide in the character or situation of the land to mark localities of certain plants like in the Nortn, where the fertile peat bogs and marl beds, the cold sphagnous swamps and deep hemlock forests, and the exposed mountain ridges and Alpine peaks are good indices. But in the detection of local species here one depends apparently on mere luck.

On the morning of the 19th there appeared the first and only frost of the season, and in consequence the banana leaves assumed a bronze tint, the early vegetables a scalded appearance with drooping foliage, and the floral display of the forest a generally melancholic hue, thus practically ending field work for a time, and I made my departure southward.

In the close of June on my return North, I made a sojourn here for a few days. And behold what a change! The variety and luxuriance of the vegetation had covered many of my former landmarks, and the place appeared not the same. With the limited time and good prospects I set diligently to work and added good specimens of *Clematis reticulata*, Walt., *Cocculus Carolinus*, DC., *Polygala leptostachys*, Shuttl., *Krameria lanceolata*, Torr., *Tephrosia hispidula*, Pursh., *Æschynomene hispida*, Willd., and *viscidula*, Michx., *Zornia tetraphylla*, Michx., *Rhynchosia tomentosa*, T. & Gr. var., *erecta* T. & Gr., *Ludwigia arcuata*. Walt., *Melothria pendula*, T., *Spermacoce involucrata*, Pursh., *Tetragonotheca helianthoides*, T., *Verbena Caroliniana*, Mx., *Asclepias cinerea*, Walt., *Eriogonum longifolium*, Nutt, and *tomentosum*, Mx., *Euphorbia cordifolia*, Ell., *Schœnocaulon gracilis*, Gray, flowers and fruit., *Fimbristylis Warei*, Torr, *Carex Elliottii*, Schw. and Torr., *Panicum Walteri*, Ell., *Actinomeris intermedia*, Chapm,. *Boerhaavia erecta*, L. and *Habenaria repens*, Nutt. All in fine state for collection and with three exceptions the only locality observed.

DR. A. P. GARBER.